

True Dual Domain Audio Testing in a Portable Package

- Comprehensive analog audio analyzer
- True digital domain analyzer with -140 dB residual noise
- Independent analog & digital audio generators and analyzers
- Generate and measure interface jitter
- Digital interface analyzer
- View AES/EBU status bits
- Internal save and recall of 30 test setups
- Loudspeaker monitor for digital & analog audio signals

Audio precision





ANALOG + DIGITAL + AES/EBU/IEC:

Portable One Dual Domain® is a comprehensive audio test set for both analog and digital audio, as well as for generation and measurement of AES/EBU/IEC digital characteristics such as Jitter. Like our System One and System Two products, Portable One Dual Domain features true Dual Domain architecture. Digital signals are generated and measured purely in the digital domain, resulting in the -130 dB distortion and -140 dB noise residuals necessary for making useful digital audio measurements.

RUGGED, PROVEN TECHNOLOGY:

Portable One Dual Domain is designed for field or lab use. As the newest addition to the Portable One family it draws on packaging, performance and user interface technology proven in thousands of Portable One and Portable One Plus units, and digital measurement technology from thousands more System One and System Two units in use worldwide.

EASY TO USE: Measurement functions are simply selected from the front panel. Just press a button and make the measurement. Selection of analog and digital inputs is clearly indicated on the front panel with LED legends. Portable One Dual Domain makes graphs of swept measurements in real time on the high contrast back-lit LCD display, including both Frequency and Amplitude sweps. Hard copy high-resolution graphs, compact screen-sized graphs or tabular data listings are made from Portable One Dual Domain to laser,

ink jet or dot matrix printers at the touch of a button. Bargraphs can display measurements ranging from AC mains frequency to digital interface error rate... and nearly everything in between. Separate buttons and knobs provide independent control of frequency and amplitude. The buttons provide large and medium steps (decade and 1/3 octave steps for frequency, 10 dB and 1 dB for amplitude), with knobs for finer resolution. When not otherwise used, the setting knobs and buttons also provide a convenient human interface for scrolling display cursors and for entry of other settings and data.

STEREO: Portable One Dual Domain is a true two channel instrument. Both analog and digital level functions measure both inputs simultaneously. Phase and level ratio measurements are also available.

FULL RANGE OF ANALOG & DIGITAL TESTING FACILITIES: Portable One Dual Domain provides complete and parallel measurement capabilities for both analog and digital audio signals. Measurements common to both domains include: Amplitude, Noise, Level (2 channels simultaneously), Frequency, Phase, THD+N, SMPTE/DIN IMD, Crosstalk and Level Ratio. Standard A-weighting, CCIR 468, and LP/HP filters are included in both domains. RMS and quasi-peak (CCIR 468) detectors are available in both domains.

ANALOG PERFORMANCE: The low distortion transformer-coupled analog generator supplies a full 30.6 dBu (+30 dBm into 600 ohms) at selecta-

ble (40,150,600 Ω) source impedances. Extremely low analyzer noise and residual distortion support measurement of high performance digital devices.

ANALOG CONVENIENCE FUNCTIONS:

In addition to the above measurements, the analog GEN LOAD function measures the input resistance of your device at any frequency you choose and makes swept impedance measurements (including loudspeakers).

AC MAINS CHECK measures the voltage, frequency and distortion of the power line without hazardous direct connections. BARGRAPH display in AC MAINS CHECK function provides a visible history of maximum and minimum mains voltage excursions.

The dBg unit (dB referred to the present analog generator amplitude) is useful for compression threshold measurements or rapid response sweeps at several different absolute levels, as well as for input to output gain/loss measurements.

600 ohm *Analog Input Terminations* are individually switchable for each channel of the analog analyzer.



DIGITAL PERFORMANCE: Portable One Dual Domain uses a true DSP-implemented analyzer for digital measurements, which results in -130 dB residual THD+N, 0.01 dB flatness, and -140 dBFS residual noise. Other mixed-signal test sets in the same price range have no digital analyzer, but use a D/A converter and an analog analyzer. These architectures "bottom out" at -70 to -84 dB residual THD+N (12-14 bit effective performance), and 0.1 dB flatness. With today's best A/D converters measuring -104 to -108 dB THD+N, their real performance is invisible to these mixed signal analyzers ... buried under the analyzer's noise and distortion floor.



Save/Reca

SAVE & I Save 30 i results d internal repeatak tion test storing t lyzed lat all settin a default tile for th and the

LEVEL - A

-12.00dbe

Portable graphs, I data eith inkjet or Graphics keys sele (includin data, bai printing

Ordering

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Optional i

Existing P above 20, Dual Dom for inforr

GPIB Inter

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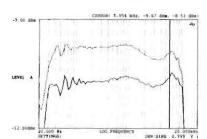
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Save/Recall Panel

SAVE & RECALL TESTS:

Save 30 instrument setups, including results data, time-stamped from the internal clock calendar. Use for repeatable, easy bench and production testing or when in the field, for storing test data to be printed or analyzed later. Each saved test includes all settings for the entire instrument, a default description or your own title for the test, the date and time, and the last test result data.



Portable One Dual Domain prints graphs, panel setups and measured data either to laser (PCL compatible), inkjet or dot matrix (PCL or IBM Graphics mode) printers. Front panel keys select two sizes of graph output (including cursor data), tabular sweep data, bargraphs and front panels for printing.

Ordering Information

Description Ori	er number
Portable One Dual Domain	P1DD
Intermodulation Distortion Option	P1-IMD
Soft Carrying Case option	P-CAS
Additional Portable One	
Dual Domain User's Maual	MAN-P1DD
Set of four XLR male/female to	

Set of two special AES/EBU cables for digital connections; available 2 or 4 meter lengths

Optional noise-weighting, band limiting and de-emphasis filters

Existing Portable One Plus units with serial numbers above 20,000 may be upgraded either to Access or Dual Domain versions. Please contact Audio Precision

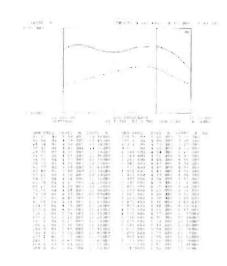
CAB-AES2

CAB-AES4

GPIB Interface (P1DD-488) for Portable One Dual Domain is under development.

For a quick print, a compact graph provides a direct replication of the LCD screen. A larger graph printout covering approximately half a page (360x280 pixels with grid lines) allows finer detail to be shown. Both graphs show key instrument setup parameters as well. Tabular data values for all swept points may be printed in order to preserve exact reading values.

The bargraph displays, with their useful minimum/maximum indicators print just as they are seen on the display, as do any desired instrument panels. Various printouts may be combined on one page, to include graphs, bargraphs and numeric data.



INTERNAL CLOCK CALENDAR:

An internal clock/calendar automatically time & date stamps saved setups & data.

The new SAVE/RECALL PRINTED OUTPUT improve-ments, INTERNAL CLOCK CALENDAR and 600 ohm ANALOG INPUT TERMINATION features are all also available in a new model analog-only Portable One, the Portable One

BUYING A PORTABLE ANALYZER FOR ANALOG AND DIGITAL AUDIO:

What to look for when evaluating competitive instruments

Digital Architecture and Features: Not all analyzers that accept a digital input signal are actually digital analyzers. Does the instrument have a real (DSP-implemented) digital domain analyzer, or just a D/A converter from the digital input connector to an analog hardware analyzer? This latter approach in a competitive unit yields distortion performance in the 12-14 bit range (-70 to -85 dB THD + N, for example).There's just not that much 12-bit digital audio around to measure anymore. Portable One Dual Domain's digital analyzer guarantees –130 dB residual distortion (nearly 22 bit performance), far in excess of the –105 to –108 dB actual linearity of today's best A/D converters.

Analog Performance: Does the instrument have an analog hardware generator and an analog hardware analyzer? Some competitive units (at twice the price of Portable One Dual Domain) use DSP techniques for all generation and analysis, so analog signals pass through converters inside the instrument. The result is THD+N as high as -79 dB, flatness as poor as -0.2 dB — inadequate for most modern audio devices.

Interface Testing: Does the instrument have independent analog, digital, and jitter generators? If it can only provide analog or digital output at any one time, you can't test a house-synchronized A/D con-verter for jitter rejection. Without independent, flexible digital audio and jitter generators, you can't measure jitter sensitivity of a D/A converter at various audio and jitter frequency combinations.

True Dual Domain: True Dual Domain hardware by definition guarantees a full range of analysis capabilities in both analog and digital domains. Everyone measures level and some measure THD + N (although implemented with extremely limited performance, as noted above). Be sure that other useful measurements such as IMD (Intermodulation Distortion), Phase, and Crosstalk are available for both analog and digital signals, not just analog.

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RATE | BNC HIZ | DELAY | 48000.0 Hz | 0.69 | Upp | 260.72 UI GEN: SINE -60.00 dB 1.0001 kHz REF: MEAS INP: 24bit OUT BLOCK

Digital I/O Panel

Extensive digital audio and interface

facilities are represented on the panels at right. The digital domain generator panels shown at upper right control sample rate, digital

audio and jitter generation.

1.000

JIT:SINE

Jitter Analyzer

1567587T

Data Error Display

iot

JITTER G BNC HIZ G FREQ UI 4.00

1.000

ERROR GA ERROR GB DATA

HP:700 Hz

Vpp 5.011 kHz

100000000

UI 5.011

1567266T B71CD2hex

SEND	CONS	EMPH: NONE	SR: 32	kHz
DINP:	CONS	EMPH : NONE EMPH : NONE	SR: 32	kHz
COPY:	NO		NO ERF	RORS
COPY:	NO		VALID	

Status Bytes Display

-3.00	dBfs	-3.	EL 00	GA dBfs	FREQ 1.0001	GB kHz
-140.0	dBfs		P	7	0.00	dB's

Stereo Digital Level with Bargraph

DTHD+N GB	-3.00	GB	анто-т св
-131.4 dB		dBfs	1.0001 kHz
-160.0 dB	٠		-80.00 aB

Digital THD + N

SAMPLE RATE GENERATOR PRATE 48000. OHz 5.00 Upp O UI SYNC: + REF

Sample Rate Generator Panel

DIGITAL	AUDIO	GEN	ERATOR	
GEN: SINE	-60.00	dB's	1.0001	kHz
DITH: NONE	OUT:24	bit		

Digital Generator Panel

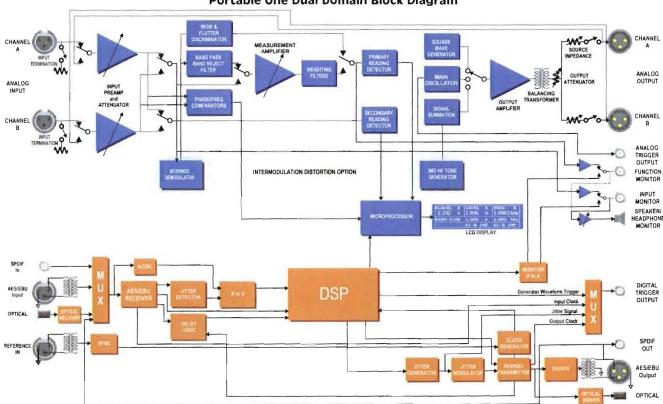
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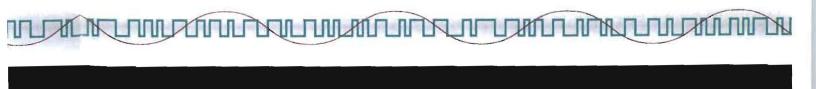
Digital Jitter Generator Panel

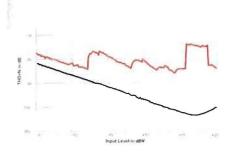
PRINTER IBM GRAPH	97 09 04 11:02:44	FREQ STEP
DIRIG OUT	INVERT	AMPL STEP
REF FRAME	DISPLAY	1dB/ISO

Setup Panel with Clock/Calendar









Competitive analyzer lacking DSP analyzer produces false THD + N readings (red trace) from a popular A/D converter. Both Portable One Dual Domain and System Two Dual Domain graph the true performance of the converter (from 5 dB to 28 dB lower), as represented by the trace in blue.

SEPARATE AND INDEPENDENT ANALOG 8 DIGITAL GENERATORS: Often necessary for dual domain testing, you may for example drive the inputs of an A/D converter with the low-distortion analog sine while simultaneously driving the converter's digital reference (house sync) input with the digital generator. Then, add jitter or vary the sample rate to see the effect on THD+N, IMD, or noise. Competitive units can drive only one domain at a time or use their analog generator to create the digital jitter, and thus can't make this measurement at all.

SEPARATE DIGITAL INPUTS & OUTPUTS: Three I/O formats: XLR, BNC, and optical (Toslink). All are completely separate from the analog audio XLR connectors,



permitting both digital and analog generators to operate simultaneously. No cable changes required to go from A/D to D/A to D/D to A/A testing of a digital tape machine, for example.

DIGITAL & ANALOG MONITOR: Listen to all measurements in the digital and analog domains over the internal loudspeaker or a pair of headphones. In analog domain, monitor signals or distortion. In digital domain, the

incoming signal, distortion, or jitter can all be monitored.

JITTER METER: Portable One Dual Domain includes jitter measurement in nanoseconds or Unit Intervals and with a choice of 50Hz or 700 Hz high pass filters.

OTHER INTERFACE SIGNAL MEASUREMENTS: Portable One Dual Domain measures key digital I/O interface parameters in addition to jitter, including sample rate, AES signal voltage, frame delay through the device under test, and delay of the input signal relative to a house sync reference (frame or block).

FLEXIBLE INTERFACE IMPAIRMENT SIMULATION: Flexible digital interface testing is vital for troubleshooting and verifying performance of digital audio at the systems level. Portable One Dual Domain allows simulation of real world transmission and interface problems:

Vary the digital output signal to test the acceptance range of your digital devices. Set sample rate anywhere from 28.8 to 52.8 kHz, not just at the three standard frequencies. Inject jitter amplitude from zero to 2.5 UI (415 nanoseconds at 48 kHz) in 0.01 UI (1.6 ns) steps or zero to 25.5 UI (4150 ns) in 0.1 UI (16 ns) steps. Injected jitter frequency can be set from 10 Hz to 38.8 kHz, not just to a fixed frequency. Adjust output signal amplitude continuously from zero to 5.12 Volts in 5 mV increments, not just at a few steps. Only Portable One Dual Domain provides this flexibility in a Portable analyzer.

INDEPENDENT INTERFACE I/O WORD WIDTHS: Word width of digital input & output are independently settable from 12 to 24 bits. Output width is set to match the device under test to assure proper dither. Input width must be set to exclude signal in the AUX bits or other low-level bit activity meaningless to the desired measurement.

INDEPENDENT INPUT & OUTPUT SAMPLE RATES: Lets you test sample rate converters. Measurement of the incoming embedded audio signal can be referred to the incoming sample rate, status byte indication of rate, or the outgoing generator rate.

DATA - **ERROR TESTING CAPABILITY FOR DIGITAL AUDIO SIGNALS:** Stimulate the test device with random data and display current or totaled error measurements on both channels.

D:ERROR	GA OT	ERROR	GB OT	DATA GA B5394Bhex
DGEN: RA				
24 00000	16	8	: :::	ACTUALBIT

Digital Data ✓ with actual bit display

The signal and analysis technique are compatible with the BITTEST feature of System One, so you can test a transmission link end-to-end with a Portable One Dual Domain at one end and a System One Dual Domain at the other.

OTHER DIGITAL CONVENIENCE FUNCTIONS

Digital Status bytes are displayed and set in high-level English.

Error flag displays for confidence, lock, coding, parity errors and the validity bit are included.

Additional active bit and actual bit displays on the panel help determine the word width of the incoming signal & detect stuck bits.

DIGITAL DITHER: Portable One Dual Domain includes a full complement of dither selections—triangular and rectangular probability distribution functions; white or shaped spectrum. Dither amplitude is automatically set to the proper value for the output word width and the selected probability function.

SAMPLE & FRAME SYNC: Synchronize Portable One Dual Domain sample and frame sync to the digital reference (house sync) input.

DIGITAL PASS MODE: Sends the input digital audio content to the output while modifying status bytes, validity bit, etc. Portable One Dual Domain can thus be used as a problem-solver between incompatible equipment.

SIGNAL MONITORING OUTPUTS:

A digital signal appropriate for synching an external oscilloscope may be derived from the input sample rate, output sample rate, input block rate, output block rate, digital audio waveform, jitter signal, or the detected interface errors. A buffered version of the balanced AES/EBU signal from the XLR input is also available, which coupled with the high input impedance of the XLR in bridging mode allows non-intrusive digital line measurements with conventional ground referenced oscilloscopes.

Extensive facilities a panels at generator right cont audio and







Data Error



INPUT









fications

Portable One Dual Doma ANALOG SIGNAL OUTPUTS Low Distortion Sine Wave equency Range squency Accuracy splitude Range Balanced Unbalances 10 Hz to 30 kHz 10 51s 120 Hz to 30 kHz +0.25 mV to 26 25 Vms [+30 6 dBu] +10 µV to 13.12 Vms [+24 6 dBu] +0.20B [±2.3°s] at 1 kHz 0.31 dB 10 05 06 $\mathbb{S}[0.0025\% + 3\,\mu\text{V}]. 80\,\text{kHz BW} \left[.92\,\text{dB}\right]$ Square Wave Frequency Rangel Amplitude Range Balanced 20 Hz-30 kHz 0 25 mVpp to 34.4 Vpp 0 25 mVpp to 17.2 Vpp +0.3 d8 [±3.5 %] at 400 Hz Турксабу 2.5 – 3.0 µsec SMPTE (or DIN) Test Signals with option PI-IMD Mo Ratio Readual IMD^a 0.0015"-[-98.5 nB] 60+7 kHz or 250+8 Source Configuration Source Impedances 40(1 (±3(1): 150(1 (±3(1): or 600(1))±2 +30 1 dBrp into 600£2 (Rs = 40£2) +24 4 dBm into 600£2 (Rs = 20£2) s/k < 110 dB or 10 µ/V whichever is greater ANALOG ANALYZER ANALOG INPUT CHARACTERISTICS Input Ranges Maximum Rated Input Input Impedance Balanced wach sele Untbalanced Mominally 100 k11 156-200pF Selectable 600 12 f.15 CMRR 80mV-2 5V range 170 dB 30 ny 20 Mtz And Crosstax 120 dB or 1 µV whichever is greater

TO FIGURE ATTE	
Wideband Amplitu	ide/Noise Function
Measurement Range	<1 µV-140 Vrms -118 dBu ta + 45 dBu
Accuracy (1 kHz)	12 0% ±0.2 dB unweighted
Flamess (1 kHz ref)	10.05 dB (20 Hz 20 kHz)
Bandwidth Limiting Filte	
LF -3 dB	<10 Hz. 400 Hz ±5° (3-pow)
HF-3 dB	22 kHz, 30 kHz, 90 kHz (3-pole), or >360 kHz
Weighting filters	ANSI-IEC A' COIR-OPK COIR-ARM COIR-RMS
Optional Filters	up to 2 (Aux 1 and Aux 2)
Detection	RMS (1=60 masc) AVG QPA (CCIA Rec 468)
Residual Noise	
22 Hz-22 kHz BW	±1.5 μV ±114 αΕυ]
A-weighted	E1 0 μV -118 αΒα
CCIR-QPk	=5.0 µV (-104 dBu)
Frequency Meter F	Related (both channels
Measurement Range	10 Hz-200 kHz
Accuracy	±0.01% [±100 PPM]
Resolution	5 digits

ed (both channers)
10 mV-140 V for specified accuracy and flatness useable to <100 μV [-38 dBu to + 45 dBu]
10 t dB + 100µV
(Vin > 10 mV) ±0.05 dB (20 Hz-20 kHz)
ide Function
20 Hz to 120 kHz
Q=5 (2-pole)
±0.3 dB, 20 Hz-120 kHz

Measurement Range	e0.001*e-100*s
Accuracy	+1 dB 20 Hz-120 kHz harmonics
Measurement Bandwidth	
LF 3:18	<10 or 400 Hz
HF J dB	22K 30k 80k or >300 kHz
Planet of TURN AL	

Crosstalk Function	
Frequency Range Measurement Range Accuracy	10 Hz to 120 kHz -140 dB to 0 dB =0.5 dB
SMPTE (DIN) IMD F	unction with opinion (P1-IMD)
Test Signal Compatibility IMD Measured Measurement Range Accuracy Residual IMD	40-250 Hz and 3 kHz -20 kHz in 0.1 to 8 1 ratio Amphilude modulation products of the HF tone <0.0025°20° 1.1 uB per SMPTE FIP-120-1983, DIN 45403 <0.0025°
Wow & Flutter Fund	tion
Test Signal Compatibility Accuracy (4 Hz) Detection Modes Residual W+F	2.80 kHz:3.35 kHz ±(5% of reading + 0.002%) IEC DIN, NAB, JIS <0.005% Weighted, <0.01% Unweighted
DIGIT	TAL SIGNAL GENERATOR
DIGITAL OUTPUT C	HARACTERISTICS
Output Formals Sample Rates Sample Rate Accuracy Word Width	AESÆBU (per AES3-1992); SPDIF-EIAJ. Opinca 28 8 kHz 52 8 kHz AESÆBU ±0.002°s [±20 PPM] lockable to external referen 12 to 24 bits (even values)
Sine Wave	
Frequency Range Frequency Resolution Flatness Residual Distortion	10 Hz to 47% of sample rate (22.56 kHz at 48 ks Sample Rate = 2° (typically 0.006 Hz at 48 ks/s ±0.001 dB ±0.0001%] 140 dB]
Square Wave	a constant and a cons
Frequency Range Frequencies available	16 Hz to 116 sample rate I, = 4096 to I, = 6, in even integer divisors
SMPTE/DIN IMD Wa	veform with option PT-MD
Upper Tone Range Lower Tone Range Amplitude Ratio Residual Distortion	Choice of 7 kHz or 8 kHz Choice of 50 Hz, 60 Hz, 70 Hz, or 250 Hz 4 1 (LF HF) =0.00001% [140 dB] at 4.1 ratio
Random Generator	Waveform
Waveform	Compatible with BITTEST used in System One
Dither (all waveform	is)
Probability Distribution Spectral Distribution Ampitude	Triangular or roctangular independent each chair Flat (white) or Shaped 1+6 dB-oct, mangular only Automatically tracks word width or off
AES/EE	U INTERFACE GENERATION

Probability Distribution Spectral Distribution Ampirtude	Triangular or rectangular independent each channe Flat (white) or Shaped (+6 dB-oct, Inangular only) Automatically tracks word width or off		
AES/E	U INTERFACE GENERATION		
Interface Signal			
Amplitude Range Balanced (XLR) Unbalanced (BNC) Channel Status Bits Validity Flag	0-5 12 Vpp. info 110(2 in 5 mV steps 0 to 1 28 Vpp. info 75(3 in 1 25 mV steps English language decoded, Professional consume Selectable, set or deared		
AES/EBU Impairme	nts		
Induced Jitter Jitter Freq Range Jitter Amplitude	Sinewave 10 Hz to 38 8 kHz 0-2 55 Ut opps in steps of 0.31 Ut or better 2 6-25 5 Ut in steps of 0.1 Ut or better		
Residual Jitter RMS response Peak response	total generator analyzer) peak to peak calibrated =0.01 LH (700 Hz-30 kHz BW) =0.03 LH (700 Hz-30 kHz BW)		
Spunous Jitter Products Jitter & Ref Delay Dff Jitter On	- 0 001 UI = 30 dB below litter signal		
REFERENCE INPUT	CHARACTERISTICS		
Input Formats Input Sample Rates Lock Range	AES EBU (per AES 3-1992) 28 8 hHz 52 8 kHz AES EBU ±0 0025% (±25 PPM)		
	DIGITAL ANALYZER		
DIGITAL INPUT CH	ARACTERISTICS		
Input Formats Sample Rates Word Width	AES/EBU (per AES 3-1992) SPOIF EIAJ, Optical 28 8 kHz-52 8 kHz AES/EBU 12 to 24 bits		
EMBEDDED AUDIO	MEASUREMENTS		

AES-EBU (per AES3-1992), SPDIF-EIAJ, Optical 28 8 kHz-52 8 kHz AES-EBU ±0.002% [±20 PPM] lockable to external reference 12 to 24 bits (even values)

Measurement Ranges	±180 +90 270 or -90 +270 deg	Lock Range	±0 0025% (±25 PPM)		
Accuracy 20 Hz-20 kHz	±2 0 deg		DIGITAL ANALYZER		
Resolution Level Meter Related	0.1 deg	DIGITAL INPUT C	DIGITAL INPUT CHARACTERISTICS		
Measurement Range	10 mV-140 V for specified accuracy and flatness useable to <100 µV [-38 dBu to + 45 dBu]	Input Formats Sample Rates Word Width	AES/EBU Iper AES 3-1992); SPOIF EIAJ, Optical 28 8 kHz-52 8 kHz, AES/EBU 12 to 24 bits		
Accuracy (1 kHz) Flamess (1 kHz ref)	±0.1 dB + 100µV (Vin > 10 mV) ±0.05 dB (20 Hz-20 kHz)	EMBEDDED AUDIO MEASUREMENTS			
Bandpass Amplitud	le Function	Wideband Level/A	Wideband Level/Amplitude		
Tuning Range (f.) Bandpass Response Accuracy (at f.)	20 Hz to 120 kHz Q=5 (2-poie) ±0.3 dB. 20 Hz-120 kHz	Range Frequency Range Accuracy	0 dBFS to 140 dBFS <10 Hz-22 0 kHz at 48 ks sec ±0 0 dB = 90 dBFS		
THD+N / SINAD Fur	action	Flatness	±0.01 dB 15 Hz-22 kHz		
Fundamental Range Measurement Range Accuracy	10 Hz 10 100 kHz. THD+N mode <0.001*+100*- +1.0B. 20 Hz-120 kHz harmonius	High pass Filters Low pass Filters Weighting Eitlers Residual Notice	22 Hz, 400 Hz, 2-pole Butterworth 15 kHz, 20 kHz, 8-pole elighter low-pass ANSI-IEC 'A weighting CCIR QPs, CCIR RMS 140 dBFS unweighted: 142 dBFS A-weighted		
Measurement Bandwidth LF-3::18	<10 or 400 Hz	Narrow Band Amplitude			
HF-3 dB Residual THO+N	22K 30k 80k or >300 kHz	Frequency Range	0.04% to 40% of sample rate. (10 Hz-19.2 kHz at 48.0 ks/sec)		
25 Hz-20 kHz	≤(0.0025 + 3.0 µV), 80 kHz BW [-92 dB]	Filter Shape	10-pole, Q=19 (BW = 5.3% of f.)		

THD+N Measurements 0.02% to 45% of sample rate 110 Hz 22 0 kHz at 48 0 ks/sac 5 136 dBFS 22 Hz 400 Hz 2 pole Butlerworth 15 kHz 20 kHz 5 pole elliptic low pass ANSHEC A' weighting CCIR OPx, CCIR RMS 140 dBFS unweighted. 142 dBFS A weighted

Test Signal Compatibility 40-250 Hz and 3 kHz 20 kHz in 1.1 to 4.1 ratio IMD Measured Amplitude modulishon products of the HF fone 40 0001%-10% 20 0001%-10% 20 0001%-10% 20 0001%-10% 20 0001%-10% 20 0001% 20 00 Frequency Measurements

5 Hz to 47% of sample rate Phase Measurement Related BITTEST mea Measurement Compatible with random mode System One BITTEST DIGITAL INTERFACE MEASUREMENTS

AES/EBU Impairments, real time displays ±0.002% [±20 PPM] internal net ±0.0001% [±1 PPM] external net Measures status propagation from the AES EBU output to the input. Range is 0.192 (frames) resolution ±60 ns. Input Sample Rate AES.EBU input Voltage

Balanced

Unbalanced

Unbalanced

100 mV to 10 24 Vpp. ±15° + 50 mV)

100 mV to 2 56 Vpp. ±15° + 12 mV)

Inter Amplitude (500 Hz)

Inter Flatness

1 5 68 100 Hz 22 Hz (50 Hz Hz)

Atter Flatness

1 5 68 100 Hz 22 Hz (50 Hz Hz)

Atter Flatness

1 5 68 100 Hz 22 Hz (50 Hz Hz)

Atter Flatness

1 5 68 100 Hz 22 Hz (50 Hz Hz)

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AES EBU Input Voltage
Balanced
Unbalanced peak calibrated Spunous Jither Products Channel Status Bits Validity Flag Panty: Signal Confidence Receiver Lock, Coding Er

Generator Analog Sync Output Digital Sync Output Analyzer Input Monito Analyzer Reading AUDIO MONITOR Power Output Typically 1 Was GENERAL / ENVIRONMENTAL Power Requirements Temperature Range Humidity EMC

AUXILIARY SIGNALS

100 (20/23/240 Vac (-10% +6%) 50-60 Hz, 50 VA max 6 C to +40 C Operating - (2 Oc to +60 C Storage 90°, RH to a less +40 C (non-condensing) Comples with 93:336 EEC (015PR 22 (class B), and FCC 15 subgard 1 (class B) 16.5 x 6 O x 13.6 inches (41 9 x 15.2 x 34.5 cm) Approximately 250 bit 9 1 kg/ Comples with 73/23/EEC (33-68/EEC EN61010 and IEC 1010 including Amendments 1 and 2)

Audio precision

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